REMARKS

The non-final Office Action issued September 12, 2002 has been reviewed and the comments of the U.S. Patent and Trademark Office have been considered. Claims 2, 4, 6, 13, 15, and 18 have been amended. New claims 21-39 have been added. Accordingly, Applicant requests reconsideration of the pending claims 1-39.

Applicants thank the Examiner for the courteous telephone interview conducted on December 10, 2002. During the interview, it was determined that the CD-ROMs submitted on March 20, 2002 were misplaced and therefore not in the file for consideration. At the end of the interview, the Examiner agreed to consider the copending applications if the CD-ROMs were to be submitted along with a copy of the "Return PostCard Receipt" showing that the CD-ROMs were filed on March 20, 2002.

Applicants also thank the Examiner for indicating that claims 6-12 and 14-17 would be allowable if rewritten into independent form. Claims 6 and 15 have been so rewritten. Dependent claims 2, 4, 6, 13, 15, and 18 also have been amended to depend from one of allowable claims 6 and 15. Further, new claims 21-39 have also been added to depend from one of allowable claims 6 and 15. Accordingly, claims 2-39 are in condition for allowance.

The drawings stand objected to for failing to label the orifice disk (254), the bore (267) and elongated openings (269). Applicants propose to add reference numeral 267 in Fig. 1 so as to comport with the specification. Applicants have amended the specification to delete reference numerals 254 and 269 as they are not necessary to an understanding of the claimed invention. These changes are delineated in a separate paper titled "Request for Approval of Drawing Revisions." Support for these changes is provided in the originally filed specification at, for example, pages 4-6 and Figures 1-4. No new matter has been entered. Accordingly, these objections to the drawings should be withdrawn.

Claim 6 has been objected due to an informality. Claim 6 has been amended to delete the extra comma in line 2 as suggested by the Examiner. Accordingly, this objection has been overcome and should be withdrawn.

Claims 1, 3-5, 13, 18, and 19 stand rejected under 35 U.S.C. §103 as being unpatentable over U.S. Patent No. 6,012,655 to Maier in view of Admitted Prior Art ("APA"). Claims 2 and

20 stand rejected under 35 U.S.C. §103 as being unpatentable over Maier in view of U.S. Patent No. 5,979,866 to Baxter *et al* ("Baxter").

Applicants respectfully traverse these rejections because Maier, APA or Baxter, singularly or in combination, fails to teach or suggest the claimed invention as a whole.

Claim 1 recites a method of fabricating a fuel injector that can be achieved, in part, by "fabricating" a fuel group in a clean room, and "fabricating" a power group outside the clean room.

Maier states, at column 2, lines 4-8, that a plastic extrusion coating injection process for a plastic part can take place "outside the assembly line for the valve part." As recognized by the Office Action, Maier fails to teach or suggest a "clean room" as described in the originally filed specification at, for example, p. 10, lines 26-30, where an air filtration system is provided to the clean room to remove particulates in the ambient environment of the clean room. Thus, Maier fails to teach or suggest fabricating a valve part in a separate room with predefined ambient conditions (e.g., removal of particulates from the environment) that qualifies as a clean room.

Notwithstanding the deficiencies of Maier, the Office Action relies upon the APA to assert that it would have been obvious to provide a clean room specifically for the valve part 70 (i.e. fuel group). The Office Action based this assertion on a description of the secondary teaching that states the belief that known fuel injectors "must be assembled entirely in an environment that is substantially free of contaminants." (emphasis added). That is to say, the teaching of the APA specifically requires that all components are fabricated in the same environment (i.e., a clean room). Hence, at most, one of ordinary skill in the art would fabricate the valve part and plastic part (i.e., all parts) of Maier in a clean room as taught by the APA—**instead** of fabricating one group of components in a specific ambient environment (i.e., clean room) and fabricating another group exterior of that clean room, as recited in claim 1. Thus, absent the benefit of Applicants' disclosure as a guide, there is no suggestion or motivation in Maier or the APA to fabricate one component in an environment with specific ambient conditions (i.e., a clean room) and to fabricate another component outside of that room with specified ambient conditions. Accordingly, claim 1 is patentable over Maier or APA, singularly or in combination thereof.

Despite the deficiencies in Maier or APA, the Office Action relies upon the teachings of Baxter to render dependent claims 2 and 20 obvious. Baxter, however, fails to cure the deficiencies of Maier or APA. And notwithstanding the allowable features of originally filed claims 2 and 20, it is noted that this rejection is rendered moot because claims 2 and 20 have been amended to depend from allowable claim 6.

CONCLUSION

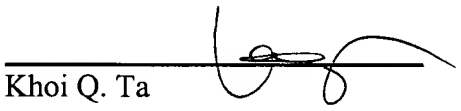
In view of the foregoing amendments and remarks, Applicants respectfully request the reconsideration and reexamination of this application and allowance of the pending claims 1-39. Applicants respectfully invite the Examiner to contact the undersigned at (202) 739-5203 if there are any outstanding issues that can be resolved via a telephone conference.

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached pages are captioned "**VERSION WITH MARKINGS TO SHOW CHANGES MADE.**"

EXCEPT for issue fees payable under 37 C.F.R. §1.18, the Commissioner is hereby authorized by this paper to charge any additional fees during the entire pendency of this application including fees due under 37 C.F.R. §§1.16 and 1.17 which may be required, including any required extension of time fees, or credit any overpayment to Deposit Account No. 50-0310. This paragraph is intended to be a **CONSTRUCTIVE PETITION FOR EXTENSION OF TIME** in accordance with 37 C.F.R. §1.136(a)(3).

Respectfully submitted,

MORGAN, LEWIS & BOCKIUS LLP



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Date: 10 December 2002

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IN THE SPECIFICATION:

The paragraphs starting at page 3, line 17, has been amended as follows:

--A seat 250 is secured at the second end of the tube assembly. The seat 250 defines an opening centered on the axis A-A and through which fuel can flow into the internal combustion engine (not shown). The seat 250 includes a sealing surface 252 surrounding the opening. The sealing surface, which faces the interior of the valve body 240, can be frustoconical or concave in shape, and can have a finished surface. An orifice disk ~~254~~ can be used in connection with the seat 250 to provide at least one precisely sized and oriented orifice in order to obtain a particular fuel spray pattern.

A seat 250 is secured at the second end of the tube assembly. The seat 250 defines an opening centered on the axis A-A and through which fuel can flow into the internal combustion engine (not shown). The seat 250 includes a sealing surface 252 surrounding the opening. The sealing surface, which faces the interior of the valve body 240, can be frustoconical or concave in shape, and can have a finished surface. An orifice disk ~~254~~ can be used in connection with the seat 250 to provide at least one precisely sized and oriented orifice in order to obtain a particular fuel spray pattern.--

The paragraph starting at page 4, line 13, has been amended as follow:

--Fuel flow through the armature assembly 260 can be provided by at least one axially extending through-bore 267 and at least one apertures 268 through a wall of the armature assembly 260. The apertures 268, which can be of any shape, preferably are axially elongated, as shown by elongated openings ~~269~~, to facilitate the passage of gas bubbles. For example, in the case of a separate intermediate portion 266 that is formed by rolling a sheet substantially into a tube, the apertures 268 can be an axially extending slit defined between non-abutting edges of the rolled sheet. However, the apertures 268, in addition to the slit, would preferably include openings extending through the sheet. The apertures 268 provide fluid communication between the at least one through-bore 267 and the interior of the valve body 240. Thus, in the open

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configuration, fuel can be communicated from the through-bore 267, through the apertures 268 and the interior of the valve body 240, around the closure member 264, and through the opening into the engine (not shown).--

The paragraph starting at page 5, line 20, has been amended as follow:

--The valve group subassembly 200 can be assembled as follows. The non-magnetic shell 230 is connected to the inlet tube 210 and to the valve body 240. The adjusting tube 281 is inserted along the axis A-A from the first inlet tube end of the inlet tube 210. Next, the resilient member 270 and the armature assembly 260 (which was previously assembled) are inserted along the axis A-A from the second valve body end of the valve body 240. The adjusting tube 281 can be inserted into the inlet tube 210 to a predetermined distance so as to abut the resilient member 270. The position of the adjusting tube 281 with respect to the inlet tube 210 can be used to adjust the dynamic properties of the resilient member 270, e.g., so as to ensure that the armature assembly 260 does not float or bounce during injection pulses. The seat 250 and orifice disk ~~254~~ are then inserted along the axis A-A from the second valve body end of the valve body 240. The seat 250 and orifice disk ~~254~~ can be fixedly attached to one another or to the valve body 240 by known attachment techniques such as laser welding, crimping, friction welding, conventional welding, etc.--

The paragraph starting at page 8, line 11, has been amended as follow:

--In operation, the electromagnetic coil 310 is energized, thereby generating magnetic flux in the magnetic circuit. The magnetic flux moves armature assembly 260 (along the axis A-A, according to a preferred embodiment) towards the integral pole piece 220, i.e., closing the working air gap. This movement of the armature assembly 260 separates the closure member 264 from the seat 250 and allows fuel to flow from the fuel rail (not shown), through the inlet tube 210, the through-bore 267, the apertures 268 and the valve body 240, between the seat 250 and the closure member 264, through the opening, and finally through the orifice disk ~~254~~ into the internal combustion engine (not shown). When the electromagnetic coil 310 is de-energized,

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the armature assembly 260 is moved by the bias of the resilient member 270 to contiguously engage the closure member 264 with the seat 250, and thereby prevent fuel flow through the injector 100.--

The paragraph starting at page 12, line 9, has been amended as follow:

--The inserting of the fuel group subassembly 200 into the power group subassembly 300 operation can involve setting the relative rotational orientation of fuel group subassembly 200 with respect to the power group subassembly 300. According to the preferred embodiments, the fuel group can be rotated such that the included angle between a reference point on the orifice plate ~~254~~ and a reference point on the injector harness connector 321 is within a predetermined angle. The relative orientation can be set using robotic cameras or computerized imaging devices to look at respective predetermined reference points on the subassemblies, orientating the subassemblies and then checking with another look and so on until the subassemblies are properly orientated before the subassemblies are inserted together.--

The paragraph starting at page 13, line 3, has been amended as follow:

--The method of assembly of the preferred embodiments, and the preferred embodiments themselves, are believed to provide manufacturing advantages and benefits. For example, because of the modular arrangement only the valve group subassembly is required to be assembled in a "clean" room environment. The power group subassembly 300 can be separately assembled outside such an environment, thereby reducing manufacturing costs. Also, the modularity of the subassemblies permits separate pre-assembly testing of the valve and the coil assemblies. Since only those individual subassemblies that test unacceptable are discarded, as opposed to discarding fully assembled injectors, manufacturing costs are reduced. Further, the use of universal components (e.g., the coil/bobbin unit, non-magnetic shell 230, seat 250, closure member 264, filter/retainer assembly 282, etc.) enables inventory costs to be reduced and permits a "just-in-time" assembly of application specific injectors. Only those components that need to vary for a particular application, e.g., the terminal 320 and inlet tube 210 need to be separately stocked. Another advantage is that by locating the working air gap, i.e., between the armature

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assembly 260 and the pole piece 220, within the electromagnetic coil, the number of windings can be reduced. In addition to cost savings in the amount of wire 312 that is used, less energy is required to produce the required magnetic flux and less heat builds-up in the coil (this heat must be dissipated to ensure consistent operation of the injector). Yet another advantage is that the modular construction enables the orifice disk ~~254~~ to be attached at a later stage in the assembly process, even as the final step of the assembly process. This just-in-time assembly of the orifice disk ~~254~~ allows the selection of extended valve bodies depending on the operating requirement. Further advantages of the modular assembly include out-sourcing construction of the power group subassembly 300, which does not need to occur in a clean room environment. And even if the power group subassembly 300 is not out-sourced, the cost of providing additional clean room space is reduced.--

IN THE CLAIMS:

Claims 21-39 have been added.

Claims 2, 4, 6, 13, 15, and 18 have been amended as follow:

2. (Amended) The method according to claim 6~~1~~, further comprising, prior to inserting the fuel group into the power group, performing at least one fuel flow tests on the fuel group.

4. (Amended) The method according to claim 6~~1~~, wherein the inserting is performed exterior of the clean room.

6. (Amended) A method of fabricating a fuel injector comprising:

providing a clean room;

fabricating a fuel group in the clean room~~The method according to claim 1, further comprising~~, and prior to fabricating the fuel group, assembling a fuel tube~~,~~ assembly, the fuel tube assembly including an inlet tube and a non-magnetic shell;

fabricating a power group exterior of the clean room;

inserting the fuel group into the power group; and

fixedly connecting the fuel group to the power group.

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13. (Amended) The method according to claim 6~~1~~, wherein inserting the fuel group into the power group is performed exterior of the clean room.

15. (Amended) A method of fabricating a fuel injector comprising:

providing a clean room;

fabricating a fuel group in the clean room;

fabricating a power group exterior of the clean room, the ~~The method according to claim 1, wherein~~ fabricating the power group comprises:

providing a magnetic housing;

providing an electro-magnetic solenoid coil; and

fixedly connecting the magnetic housing to the electro-magnetic solenoid coil;

inserting the fuel group into the power group; and

fixedly connecting the fuel group to the power group.

18. (Amended) The method according to claim 6~~1~~, wherein inserting the fuel group into the power group is performed exterior of the clean room.

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